

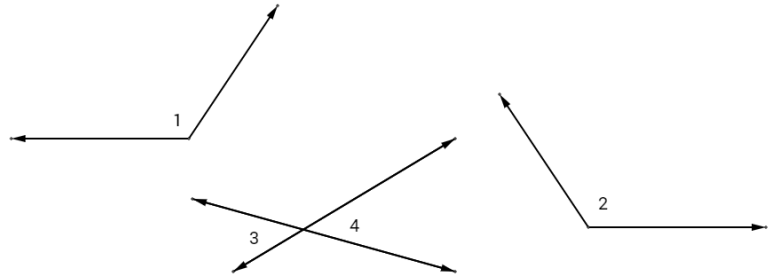
### Activity 1: Mystery Proof

Get a proof envelope from the front of the class. In it you will find the statements and reasons needed to complete the following proof, but all of the statements and reasons have been mixed up. Put them in the correct order, and in the correct columns, in order to complete the proof.

**Given:**  $\angle 1$  is supplementary to  $\angle 3$ .

$\angle 2$  is supplementary to  $\angle 4$ .

**Prove:**  $\angle 1 \cong \angle 2$ .



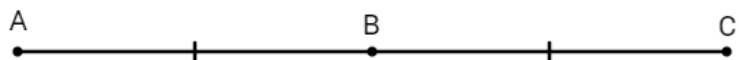
| Statements | Reasons |
|------------|---------|
| 1.         | 1.      |
| 2.         | 2.      |
| 3.         | 3.      |
| 4.         | 4.      |
| 5.         | 5.      |
| 6.         | 6.      |
| 7.         | 7.      |
| 8.         | 8.      |
| 9.         | 9.      |
| 10.        | 10.     |

### Activity 2: Fill in the Reasons

Complete the proof by providing a reason for each statement.

**Given:**  $B$  is the midpoint of  $\overline{AC}$ .

**Prove:**  $AB = \frac{AC}{2}$ .



| Statements                                  | Reasons |
|---|---------|
| 1. $B$ is the midpoint of $\overline{AC}$ . | 1.      |
| 2. $AB = BC$                                | 2.      |
| 3. $AB + BC = AC$                           | 3.      |
| 4. $AB + AB = AC$                           | 4.      |
| 5. $2AB = AC$                               | 5.      |
| 6. $AB = \frac{AC}{2}$                      | 6.      |

**Activity 3: Fill in the Blank Proof**

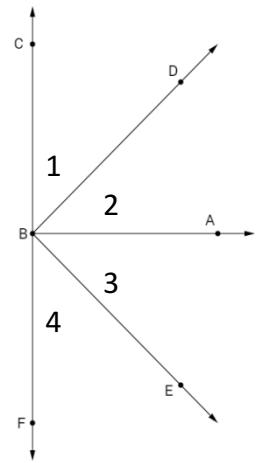
In the following proofs, some statements and some reasons have been given. Complete the proofs by filling in the blank statements and reasons.

**Given:**  $\overline{FL} \cong \overline{AT}$   
**Prove:**  $\overline{FA} \cong \overline{LT}$



| Statements                             | Reasons                             |
|--|-------------------------------------|
| 1.                                     | 1. Given                            |
| 2. $FL = AT$                           | 2.                                  |
| 3. $\overline{LA} \cong \overline{LA}$ | 3.                                  |
| 4.                                     | 4. Definition of congruent segments |
| 5.                                     | 5. Addition Property of equality    |
| 6. $FA = FL + LA$<br>$LT = LA + AT$    | 6.                                  |
| 7. $FA = LT$                           | 7.                                  |
| 8.                                     | 8. Definition of congruent segments |

**Given:**  $\overline{BA} \perp \overline{CF}$   
 $\overline{BA}$  bisects  $\angle DBE$   
**Prove:**  $\angle 1 \cong \angle 4$



| Statements  | Reasons                            |
|---|------------------------------------|
| 1.  | 1.                                 |
| 2. $m\angle ABC = m\angle ABF = 90^\circ$   | 2.                                 |
| 3.  | 3.                                 |
| 4.  | 4. Definition of angle bisector    |
| 5.  | 5. Definition of congruent angles  |
| 6. $m\angle 1 + m\angle 2 = m\angle ABC$<br>$m\angle 3 + m\angle 4 = m\angle ABF$ | 6.                                 |
| 7.  | 7. Transitive Property of Equality |
| 8. $m\angle 1 + m\angle 2 = m\angle 2 + m\angle 4$                                | 8.                                 |
| 9.  | 9.                                 |
| 10.   | 10.                                |

**Activity 4: Find the Error**

The statements below “prove” that  $1 = 2$ . Describe the error.

**Given:** Some real number  $a = b$ .

**Prove:**  $1 = 2$

| Statements                     | Reasons                                |
|--------------------------------|--|
| 1. $a = b$                     | 1. Given                               |
| 2. $ab = b^2$                  | 2. Multiplication Property of Equality |
| 3. $ab - a^2 = b^2 - a^2$      | 3. Subtraction Property of Equality    |
| 4. $a(b - a) = (b + a)(b - a)$ | 4. Distributive Property               |
| 5. $a = b + a$                 | 5. Division Property of Equality       |
| 6. $a = a + a$                 | 6. Substitution Property of Equality   |
| 7. $a = 2a$                    | 7. Simplify                            |
| 8. $1 = 2$                     | 8. Division Property of Equality       |